The Termination Clause as a Sequential Screening Device

Renkun Yang

Department of Economics
The Ohio State University

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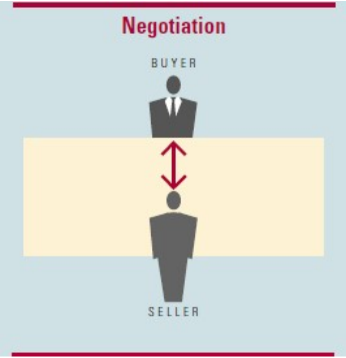
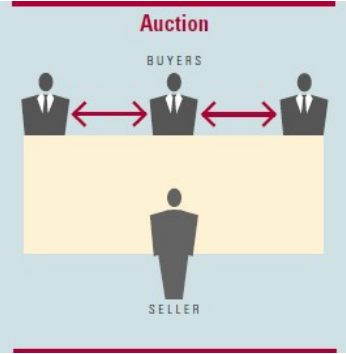
Mergers & Acquisitions Deals

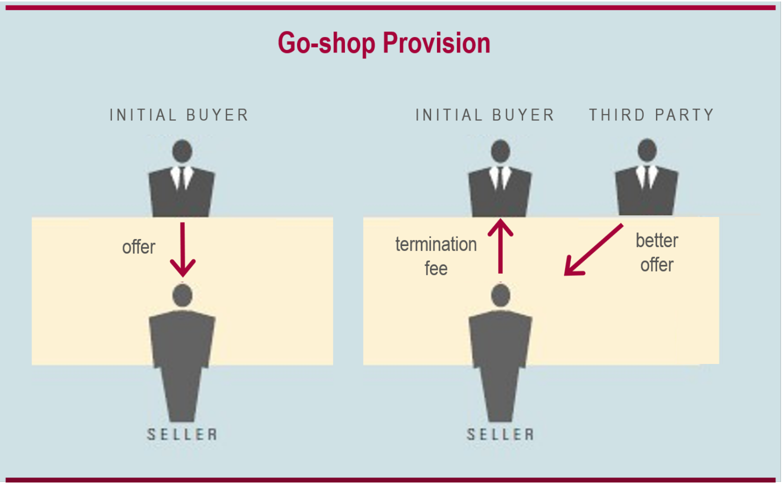
Traditional Practices





Mergers & Acquisitions Deals

Go-shop Provision



Mergers & Acquisitions Deals

Go-shop Provision

2009 Sep — 3 firms approach CKE

2010 Feb — Agreement with Thomas H. Lee at $11.05 per share

CKE solicits 28 buyers

Apr — Apollo wins at $12.55 per share

Thomas H. Lee gets termination fee $9M

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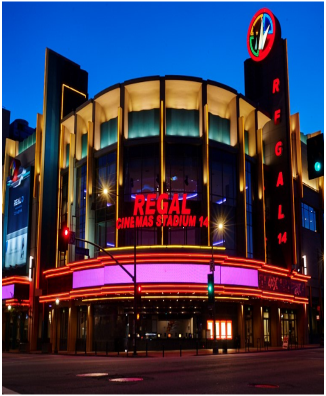

2017 Nov	Regal meets Cineworld
Dec	Agreement: $23 per share termination fee $75m
	Regal solicits 47 buyers
2018 Jan	Cineworld wins
Mar	Deal finished at $23 per share

Question

Why the emergence of go-shop deals?

Revlon Duty

1986: Delaware Court setting the *Revlon duty* principle

> The duty of the board had thus changed ... to the maximization of the company's value at a sale for the stockholders' benefit.
>
> ---
> *Revlon v. MacAndrews & Forbes Holdings, Inc., 506 A.2d.*

Controversy

1. Skepticism: favored bidder $\Rightarrow$ deterring competition

   > Generally the business people want to get the transaction done, to happen, and they want it to happen with the partner they've picked.
   >
   > *Richard I. Beattie, Chairman, Simpson Thacher & Bartlett*

2. Support: positively related to premium

   Bates and Lemmon (2003 *JFE*), Officer (2003 *JFE*), Boone and Mulherin (2007 *RFS*), Subramanian (2008 *The Business Lawyer*), Subramanian and Zhao (2020 *Harvard Law Review*).

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Preview of Results

A theoretical rationale of go-shop provisions:

when the buyer faces uncertainty prior to contracting

- initial estimate is noisy
- more documents provided after the confidential agreement

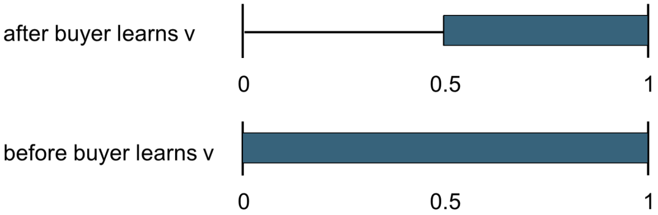
go-shop benefits the seller via sequential screening

- Sequential benefit: pricing in expectation
- Screening benefit: tailoring offers
- Competition: open to competition albeit favoring buyer one

Preview of Results

Sequential benefit: pricing in expectation

Buyer final value $v \sim U[0,1]$; Seller charges $p = 0.5$



Preview of Results

Screening benefit:

It's feasible: buyer's contract selection

- optimistic buyer: secure the target (high contract)
- pessimistic buyer: wait and see (low contract)

It's beneficial: tailoring offers

- optimistic buyer: charge high price (high contract)
- pessimistic buyer: introduce more competition (low contract)

Preview of Results

Screening benefit:

It's feasible: buyer's contract selection

- optimistic buyer: secure the target (high contract)
- pessimistic buyer: wait and see (low contract)

It's beneficial: tailoring offers

- optimistic buyer: charge high price (high contract)
- pessimistic buyer: introduce more competition (low contract)

Preview of Results

Compared to other mechanisms, a go-shop provision is

- always better than an auction without a reserve price
- better than a static auction with an optimal reserve price

  when the buyer's initial estimate is noisy
- close to full optimum when the buyer's initial estimate is noisy

Related Literature

Entry efficiency

Go-shop deals: Wang (2018)

Sequential negotiation: Fishman (1988), Bulow and Klemperer (2009), Roberts and Sweeting (2013), etc.

Strategic ex ante contract

Rent extraction via pre-contracting: Hua (2007), Che and Lewis (2007), Choi (2009), etc.

Sequential Screening

Optimal dynamic mechanism: Courty and Li (2001), Eso and Szentes (2007), Pavan et al. (2014), etc.

Real market practice: Nocke et al. (2012), Ely et al. (2017)

Related Literature

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This paper adds:

a **complementary rationale** for go-shop provisions

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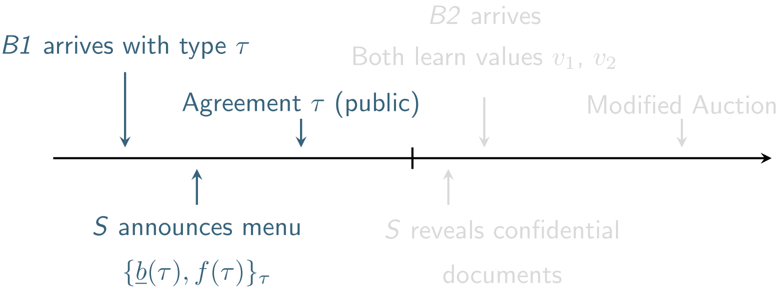
Sequential Screening

This paper adds:

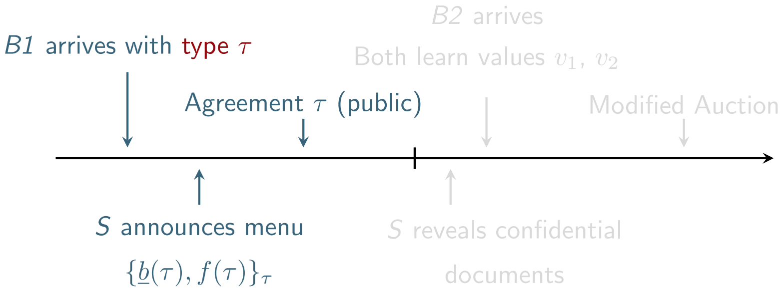
a real world application and **simple approximation**

Model

Model


B2 arrives
Both learn values v_1, v_2
B1 arrives with type τ
Agreement τ (public)
Modified Auction
S announces menu
$\{\underline{b}(\tau), f(\tau)\}_\tau$
S reveals confidential
documents

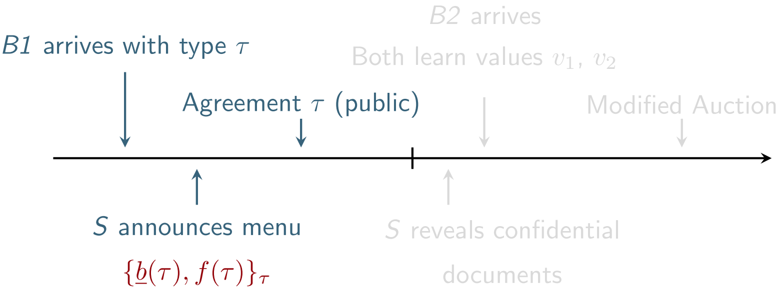
Model



Final valuation v_i: Initial type (estimate) τ:

- $\tau \sim F$ on $[\underline{\tau}, \bar{\tau}]$, final value $v_1|_\tau \sim G_\tau(\cdot)$
- G_τ ordered by FOSD: higher type is more optimistic

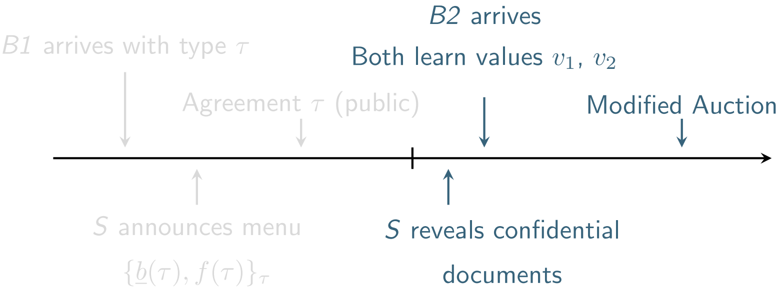
Model



Contract:

- $\underline{b}$: floor price promised by the initial buyer $B1$
- f: termination fee S pays $B1$ if sell to another buyer

Model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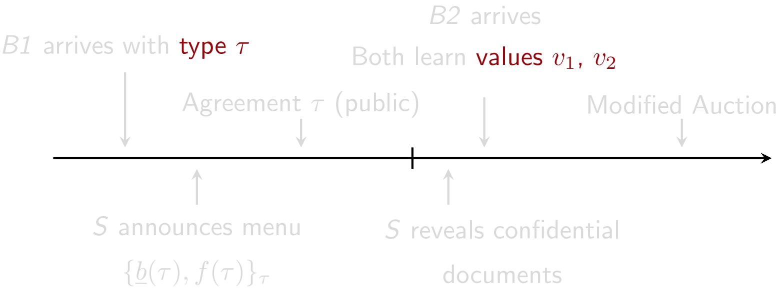

- *B1*: $\tau \sim F$ on $[\underline{\tau}, \bar{\tau}]$, final value $v_1|_\tau \sim G_\tau(\cdot)$

  G_τ ordered by FOSD: higher type is more optimistic
- *B2*: $v_2 \sim H(\cdot)$, indep of τ, v_1

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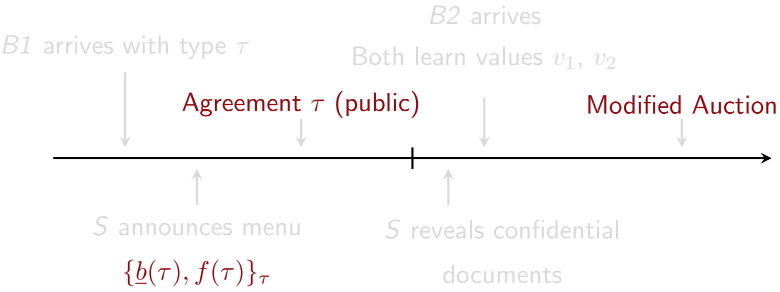

Modified English auction:

- The bid starts from $\underline{b}(\tau)$, and increases until one bidder drops
- If *B2* drops at b_2, *B1* wins and pays b_2
- If *B1* drops at b_1, *B2* wins and pays $b_1 + f(\tau)$, *B1* gets $f(\tau)$

Main Results

Bidding Stage: Equilibrium

Lemma (Bidding Equilibrium)

Given $(\underline{b}, f)$*, there exists a unique weakly dominant strategy equilibrium:* $b_1 = \max\{v_1 - f, \underline{b}\},\ b_2 = \max\{v_2 - f, \underline{b}\}$.

Proof.

- *B1* shades bid by f: opportunity cost of winning is f
- *B2* shades bid by f: paying additional f after winning

□

Bidding Stage: Equilibrium Allocation

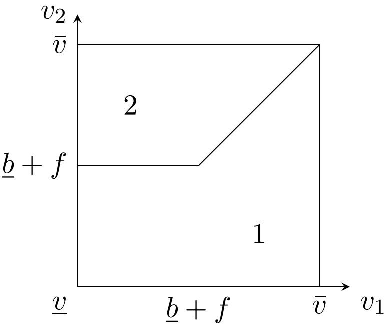

Figure 1: Equilibrium allocation in the bidding stage

Contracting Stage: Seller's Problem

The seller design the go-shop contract to

$$\max_{(\underline{b}(\tau), f(\tau))} \int_{\underline{\tau}}^{\bar{\tau}} R(\underline{b}(\tau), f(\tau)|\tau) dF(\tau)$$

s.t. $[IC_\tau]$ $E[u(\underline{b}(\tau), f(\tau))|\tau] \geq E[u(\underline{b}(\tau'), f(\tau'))|\tau] \; \forall \; \tau, \tau'$

$[IR_\tau]$ $E[u(\underline{b}(\tau), f(\tau))|\tau] \geq 0 \; \forall \; \tau$

Transformation:

Let $t(\tau) = \underline{b}(\tau) + f(\tau)$ denote the "deterrence price".

Contract $\{\underline{b}(\tau), f(\tau)\}$ is equivalent to contract $\{t(\tau), f(\tau)\}$

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$[IR_\tau]\ \forall\ \tau$ sequential benefit

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Contracting Stage: Incentive Compatibility

B1 with type τ has expected payoff

$$U(\tau) = f + \int_t^{\bar{v}} H(v)\,[1 - G(v|\tau)]\,dv - H(t)\int_{\underline{v}}^t G(v|\tau)dv$$

Proposition (Incentive Compatibility)

A go-shop mechanism is IC if and only if

1. *$t(\tau)$ is increasing in τ,*
2. *Envelope theorem holds:* $\dfrac{dU(\tau)}{d\tau} = \dfrac{\partial B(t(\tau)|\tau)}{\partial \tau}$.

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Contracting Stage: Reduced Program

Proposition

The following program solves the original seller's problem:

$$\max_{t(\tau)} \int_{\underline{\tau}}^{\bar{\tau}} R(t(\tau)|\tau)dF(\tau)$$

$$s.t.\ t(\tau) \text{ is increasing.}$$

Main Result

Proposition (Optimal go-shop contract: characterization)

The optimal deterrence price satisfies:

$$E_{G(\cdot|\tau)}\left[\phi_1(v_1,\tau)|v_1 < t(\tau)\right] = t(\tau) - \frac{1 - H(t(\tau))}{h(t(\tau))} \tag{1}$$

where $\phi_1(v_1, \tau)$ *is the dynamic virtual valuation of B1:*

$$\phi_1(v_1,\tau) = v_1 + \frac{1 - F(\tau)}{f(\tau)} \frac{\partial G(v_1|\tau)/\partial \tau}{g(v_1|\tau)}.$$

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Main Result: Intuition

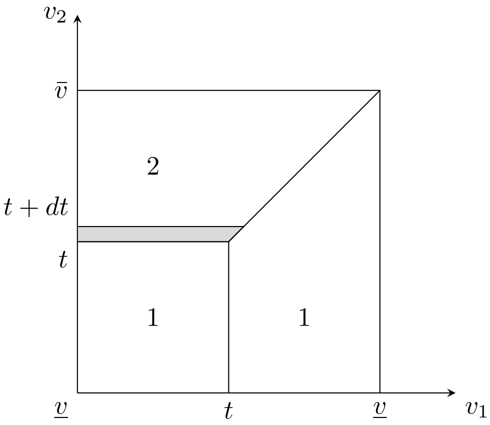

Figure 2: Equilibrium allocation in the bidding stage

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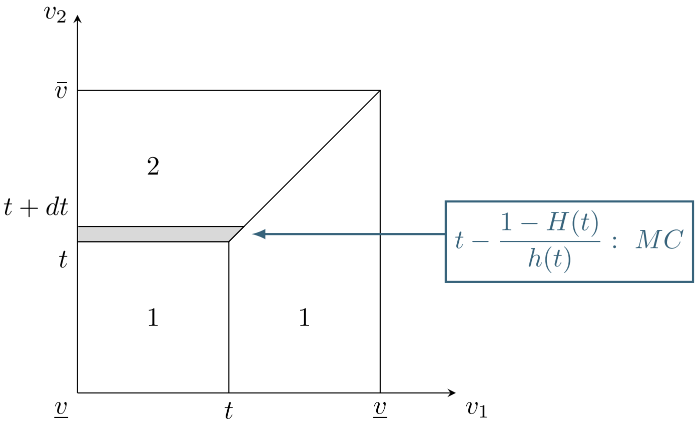

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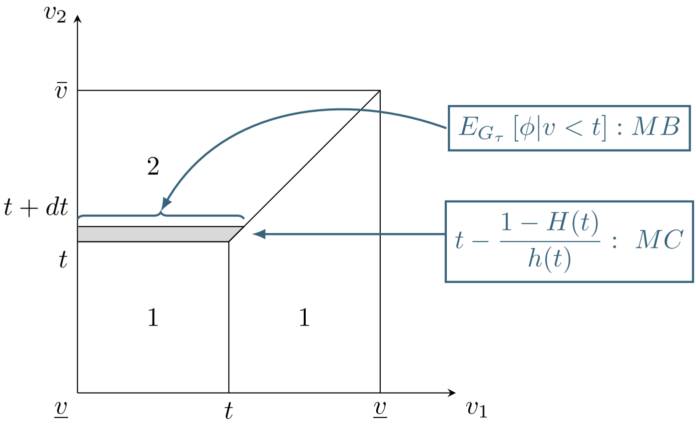

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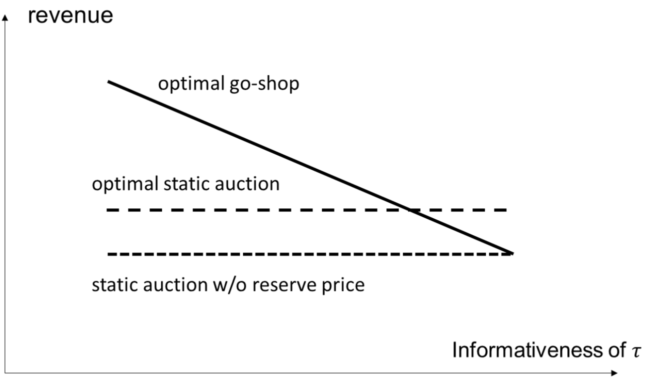
Go-shop vs. Static Auction

Go-shop vs. Optimal Static Auction $G = H$



Go-shop vs. Optimal Static Auction $G = H$

Proposition (no *ex post* information)

When $\tau = v_1$, optimal go-shop $\leq_{rev}$ optimal static auction.

Proof sketch:

1. When $\tau = v$, $t^*(\tau) \equiv t^*(v) = v$.
2. Optimal go-shop $=_{rev}$ ordinary auction $\leq_{rev}$ optimal auction.

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When τ *is a singleton, optimal go-shop* $\geq_{rev}$ *optimal static auction.*

Proof sketch:

1. Optimal go-shop with $t^* \geq$ go-shop with $t = r^*$: obvious.
2. Go-shop with $t = r^* \geq$ static auction with r^*: B1's IR

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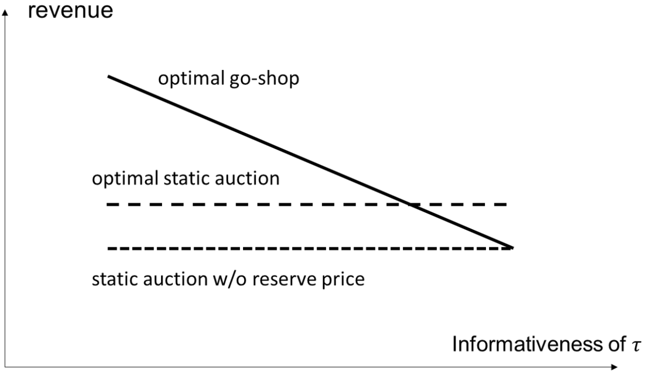
Go-shop vs. Optimal Static Auction $G = H$

What happens in between?



Go-shop vs. Optimal Static Auction $G = H$

What happens in between?

Lemma

Assume $G(v|\tau)$ is parametrized by a, and $\frac{\partial^2 G(v|\tau,a)}{\partial\tau\partial a} \leq 0 \ \forall \tau, a, v$, then the revenue from optimal go-shop decreases in a.

Proposition (general informativeness)

There exist an a^* such that $R_G \geq R_S$ if and only if $a \leq a^*$

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Go-shop vs. Fully Optimal Dynamic Mechanism

Optimal Allocation Rule

Optimal go-shop provision

Allocation based on $E\left[\phi_1(v_1,\tau)|v_1 < t\right] = t - \dfrac{1-H(t)}{h(t)}$

Optimal dynamic mechanism (second best)

Allocation based on $\phi_1(v_1,\tau) \lesseqgtr v_2 - \dfrac{1-H(v_2)}{h(v_2)}$

A Binary-continuous example:

$\tau_1 \in \{h, l\}$ with equal probability

$G_l(v_1) = v_1, G_h(v_1) = v_1^2, H(v_2) = v_2$ over $[0, 1]$

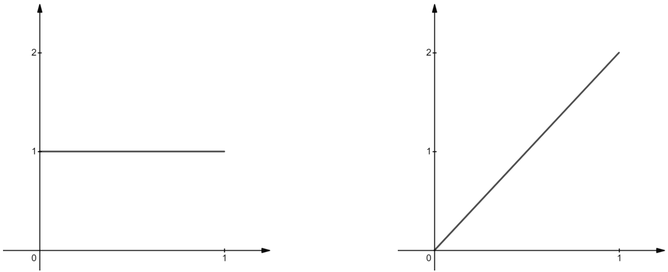
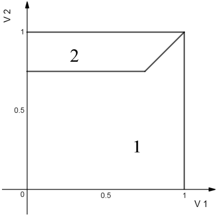
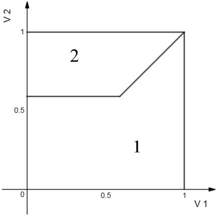


Figure 3: PDF of value v_1 when type τ is (a) low (b) high

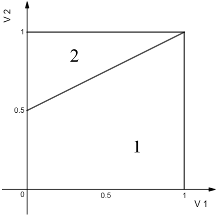
Optimal Allocation Rule



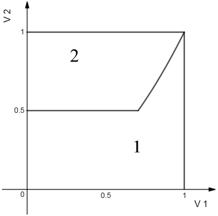
(a) go-shop ($\tau = h$)



(b) go-shop ($\tau = l$)

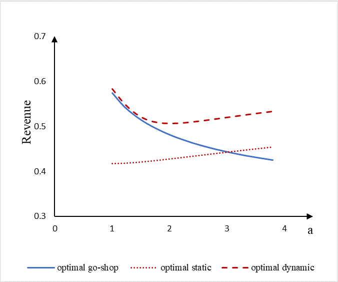


(c) optimal ($\tau = h$)

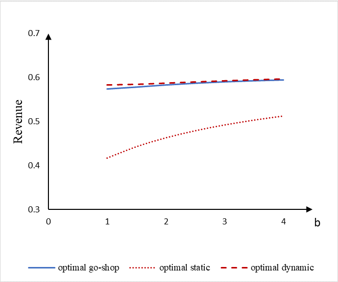


(d) optimal ($\tau = l$)

Numerical Results: Binary τ



(a) $G_h(v) = v^a, G_l(v) = v^{1/a}$



(b) $G_h(v) = v^b, G_l(v) = v$

Figure 4: Revenue comparison when (a) a ranges from uninformative to informative ; (b) informativeness is bounded

Takeaways

Fulfilling *Revlon Duty*? Potentially Yes!

How? Sequential screening + competition

When? Initial estimate is noisy

Discussion

The insights can be extended to:

1. Other markets: CEO compensation Spears and Wang (2005, JET)
2. Other (combinations of) deal protection devices: toeholds, matching rights, right of first offer/refusal, etc.

Open questions

1. Just one aspect: IPV, no entry cost, sequential screening role, etc.
2. A real acquisition involves: agency problem, entry/bidding/initiation/solicitation costs, common and private value components, reverse/bifurcated termination fees, buyer bargaining power, etc.

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Thanks!

Value Distribution

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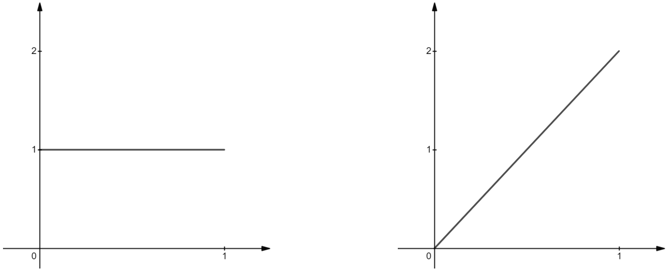

Figure 5: PDF of value v_1 when type τ is (a) low (b) high

model